



STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Department of Environmental Management  
DIVISION OF SITE REMEDIATION  
291 Promenade Street  
Providence, R.I. 02908-5767

18 March 1996

Mr. Philip Otis, P.E., Remedial Project Manager  
US Department of the Navy, Northern Division  
Code 18, Mail Stop #82  
10 Industrial Highway  
Lester, PA 19113-2090

RE: Draft Feasibility Study Report  
Site - 09 Allen Harbor Landfill  
Naval Construction Battalion Center  
Davisville, Rhode Island  
Submitted 26 January 1996

Dear Mr. Otis;

The Rhode Island Department of Environmental Management (RIDEM) Division of Site Remediation has reviewed the above referenced document and comments are attached. As you know a feasibility study is supposed to provide a balanced approach to the evaluation of alternatives based on facts. The Division's review of this document found it to be extremely biased towards the soil cap alternative. For example, the Navy highlights that design difficulties would be encountered with the multimedia cap, presumably due to its location along the shore. Design difficulties associated with the soil cap are barely mentioned, yet similar concerns would also exist with this type of cap. In addition, the Navy has recent design experience with the multilayer cap that is currently under construction at the McAllister Point Landfill (also along the shore). As another example, the Navy cites the need for a "site barrier fence" to prevent "public intrusion" onto the multimedia cap landfill for what will turn out to be a chain link fence to prevent public access to the site which is standard at most landfills. There are a number of other examples throughout the text. It is hoped the revised version of this document will provide a more balanced approach to the evaluation of the alternatives.

Based on RIDEM's review of this document we do not concur with the Navy's implied position that Alternative 2 (Soil Cap) will provide the highest degree of preservation, improvement and restoration of the natural resource habitat at the site. Specifically, this alternative does not meet

ARARs for landfill closure.

At this point in time the State recommends the Navy proceed with Alternative 4 (Multimedia Cap with Vertical Barrier Wall) which meets landfill closure ARARs. If the Navy can prove that groundwater would not contaminate the harbor or proposed wetlands then the vertical barriers would not be necessary and hence Alternative 3 (Multimedia Cap) would be acceptable.

Finally, the Navy has stated in the feasibility study that the cost to recycle the landfill is prohibitive without providing any cost information. In addition, the State has estimated about one half the volume of waste as stated in the feasibility study. Based on this it is recommended that the Navy re-examine the feasibility of this alternative since it could provide an area to re-create the wetlands that were originally filled in by the landfill. In addition, the dredge material from the proposed dredging of Allen Harbor, if found to be acceptable, could be placed here as base material for those wetlands.

If you have any questions or require additional information please call me at (401) 277 3872 ext. 7138.

Sincerely,



Richard Gottlieb, P.E.  
Principal Sanitary Engineer

Attachment

cc: W. Angell, DEM DSR  
C. Williams, EPA Region 1

letter.rwg/richg

Comments For:

**Draft Feasibility Study  
Site 09 - Allen Harbor Landfill  
Naval Construction Battalion Center  
Davisville, Rhode Island**

- 1. Page 1-4, Section 1.2.3.1, Remedial Investigations/Studies;  
Paragraph 2, Sentence 2.**

This sentence should note that sampling locations shown in Figures 4 and 5 are from all three remedial investigations, not just the Phase I.

- 2. Page 1-10, Section 1.3.7, Local Hydrogeology;  
Bullets 2 and 3.**

Please clarify that there is one confined aquifer which traverses layers 2 and 3. The way these items are currently written the reader would get the impression that there are two separate confined aquifers.

- 3. Page 1-16, Section 1.4.1.5, Conclusions Based on Nature and Extent;  
Paragraph 1, Sentence 1.**

This sentence notes that transport of COCs is primarily as particulate matter through erosion and surface water runoff from the site into near-site Allen Harbor habitat. The Division does not concur at this time with this conclusion. Based on the groundwater modeling results the Division believes there may be significant effects of the shallow groundwater on sediment (reference RIDEM comment #8 on Phase III RI dated 26 February 1996).

- 4. Page 1-17, Section 1.4.2, Fate and Transport;  
Paragraph 2, Last Two Sentences.**

*As stated in the Phase II RI and concluded above, the primary migration pathways for site-related COC are considered to be transport of soil particulates in surface water runoff and erosion. The results of groundwater, surface water and solute transport modeling support this evaluation.*

Until the effects of biodegradation and volatilization are further characterized, the Division believes that groundwater modeling conducted by the Navy demonstrates significant effects on Allen Harbor sediment (reference RIDEM comment #8 on Phase III RI dated 26 February 1996). Therefore, until further characterization is completed the effects of groundwater contamination must also be included in this statement.

- 5. Page 1-24, Section 1.4.3, Ecological Risk Assessment;  
Paragraph 1, Sentence 1.**

*Toxicological tests using these turbid samples artificially increased test organism exposure.*

Please explain how *filtered* seep samples are more representative of natural conditions.

**6. Page 1-25, Section 1.4.3, Ecological Risk Assessment;  
Paragraph 3, Sentence 3.**

*Furthermore, the results of the chemical analysis (in the Phase I Marine ERA and Phase III RAPS) and toxicity testing (in all the studies) are misleading due to the turbidity of the water samples collected for these tests.*

It would seem that *filtered* samples would be less representative of organisms in natural conditions since the sample does not contain the entire concentration of COC that the organism would encounter. Therefore, please explain why unfiltered seep samples are misleading.

**7. Page 1-26, Section 1.4.4, Freshwater/Terrestrial Risk Assessment;  
Paragraph 1, Sentence 2.**

Please state which freshwater aquatic receptors were used.

**8. Page 1-26, Section 1.4.4, Freshwater/Terrestrial Risk Assessment;  
Paragraph 1, Last Sentence.**

*Based on the weight of evidence the potential risk to aquatic receptors from the sediment COC was found to be within acceptable levels.*

If two PAHs, four pesticides, and two metals had HQs of greater than 100 please explain how the potential risk to aquatic receptors from the sediment COC was found to be within acceptable levels. It is accepted that HQs greater than 1 show potential for risk.

**9. Page 1-28, Section 1.4.5.1, Summary of Cancer Risk;  
Paragraph 3. Last Sentence.**

*The pathway was included in the HHRA at the request of state and federal regulatory agencies. should be changed to The pathway was included in the HHRA to evaluate a worst case scenario.*

**10. Page 1-30, Section 1.5, Conclusions regarding Potential Risk at Site 09;  
Bullet 1.**

This bullet states that shallow groundwater from the site does not contribute to elevated COC concentrations in intertidal sediment along the site shoreline. The Division disagrees with this statement and therefore it should be removed from the text. Refer to comments 3 and 4 for justification. In addition, the Remedial Investigation results indicate risk resulting from shellfish consumption. This should also be stated.

**11. Page 2-3, Section 2.2.2, Identification of ARARs;  
Paragraph 3.**

The Rhode Island Solid Waste regulations are appropriate. Section 3.66 of these regulations defines "Operating a Solid Waste Management Facility" as meaning receiving solid waste at any facility, whether knowingly or unknowingly. For the purposes of disposal, such receipt must be in an amount greater than three cubic yards, per Rhode Island General Law 23-18.9-5; and any property owner is considered to be operating a solid waste management facility if an amount of solid waste greater than three cubic yards exists on their property. The amount of solid waste at Allen Harbor Landfill is greater than three cubic yards and therefore meets this definition and in addition comes under these regulations because the landfill was never licensed, does not conform with closure requirements, and does not have a certificate of closure. The landfill is therefore currently in violation of these regulations. In addition to being applicable, the regulations are relevant and appropriate since solid waste is landfilled at this site.

**12. Page 2-3, Section 2.2.2, Identification of ARARs;  
Paragraph 3, Sentence 7.**

*Whereas state solid and hazardous waste regulations will be evaluated as TBC criteria, CRMC regulations and standards are applicable to remedial actions at the site.*

Section 14.06(b)(1) of the Solid Waste regulations mandate that landfill slopes not exceed a maximum of 33%. While CRMP regulations are applicable, the Solid Waste regulations are more conservative and therefore govern. Selection of a remedy that is inconsistent with this requirement is a violation of the Solid Waste regulations. The Department has on occasion granted exemptions to this requirement; and where it has not been feasible to cut slopes to the 3:1 requirement, allowances have been made for 2:1 cutbacks. If the 3:1 slope requirement can not be met, the Navy must request an ARAR waiver from this Department.

**13. Page 2-5, Section 2.3, Identification of Media/Receptors of Concern;  
Paragraph 3, Sentence 1.**

*Ground water has been identified as a minor pathway of COC from Site 09 to offsite receptors, relative to surface soil transport mechanisms and shoreline erosion.*

Until the effects of biodegradation and volatilization are further characterized the Division believes that groundwater modeling, conducted by the Navy, demonstrates significant effects on Allen Harbor sediment (reference RIDEM comment #8 on Phase III RI dated 26 February 1996). Therefore, until further characterization is completed the effects of groundwater contamination could also be a major pathway of COC from site 09 to offsite receptors.

**14. Page 2-10, Section 2.7.2.2, Point-of-Entry Treatment;  
Paragraph 2, Sentence 3.**

*In addition, shallow and deep ground water at Site 09 is classified by RIDEM as GB*

*(non-potable).*

A statement should be added to this sentence that with proper treatment GB water can be used for potable purposes.

**15. Page 2-11, Section 2.7.3, Source Control Technologies;  
Paragraph 1, Sentence 3.**

*Source control technologies typically include capping, although due to the coastal location of the site, the installation of vertical barriers can also be used to contain affected soil and fill materials.*

CRMP regulations allow for vertical barriers in very specific situations. These situations include piers, docks, etc. and where infeasible to provide a slope to retain soil and fill materials. Since Allen Harbor Landfill is not a pier and it is feasible to provide a slope, as demonstrated by past designs, the reference to the installation of vertical barriers must be removed from the above statement as it is inconsistent with both CRMP and Solid Waste regulations.

**16. Page 2-11, Section 2.7.3.1, Capping;  
Paragraph 1 (Soil Cap), Sentence 6.**

*The new cap could be constructed using sediment dredged from the entrance to Allen Harbor if analytical data indicate that the dredged material is physically suitable for incorporation into the cap.*

Since this sentence refers to the soil cap it should be modified to read ..... *material is physically and chemically suitable.....*

**17. Page 2-13, Section 2.7.3.1, Capping;  
Paragraph 1 (Synthetic Membrane Cap), Sentence 5.**

This sentence indicates that passive gas vent would be located throughout the landfill site. Since analysis for the design of landfill gasses has not been fully completed the possibility exists that an active gas venting system might be required. This sentence should be modified to reflect this.

**18. Page 2-16, Section 2.7.3.2, Shoreline protection;  
Paragraph 1 (Steel Pile Wall).**

While vertical steel sheetpile can be evaluated as a shoreline protection alternative the Division reminds the Navy that the State has previously indicated that steel sheetpile is not acceptable due to long-term durability, maintenance, and aesthetic concerns.

**19. Page 2-17, Section 2.7.4.1, Excavation;  
Paragraph 1 (Landfill Excavation - Implementability), Sentence 1.**

*Excavation of such a large volume of soil and fill materials (upwards of 800,000 cy) is*

*impractical considering the magnitude of handling, staging, transportation and treatment effort and facilities needed.*

Please explain where 800,000 cy of excavated would come from. Assuming the landfill to be 13.5 acres with an average depth of 20 feet (based on cross sections of the site) yields only 435,600 cy of material which is slightly more than half of the stated value. In addition the following paragraph, first sentence it is stated:

*The costs associated with whole-site excavation would be exorbitant and are not justified by the existing ground-water COC levels.*

Please provide the estimated costs associated with excavation of the landfill materials so that it may be determined what the Navy considers to be exorbitant costs. In addition, at this time the State believes the COC in groundwater may have a significant effect on sediment at the landfill.

**20. Pages 2-18 & 19, Section 2.7.5.1, Hydraulic Control; Extraction Wells (Implementability), Last Sentence on Page 2-18.**

*However, the treatment facility needed to treat the large volumes which would be extracted would dominate the landscape of Allen Harbor, and considering previous community resistance to a proposed shoreline barrier wall, construction of on site treatment facility is not considered an implementable action.*

In the above statement the Navy states the treatment facility would "dominate" the landscape at Allen Harbor. Perhaps the Navy can provide the length, width, and height of this proposed treatment facility. In addition, it is unlikely that the treatment facility would be built directly on the landfill, but rather would be off to one side of the landfill or even could be located in another portion of the base since the water could be pumped if this is a concern. If this is not feasible, then some form of screening could be placed around the treatment facility.

**21. Page 2-25, Section 2.7.6.1, In-Situ Treatment Technologies; Funnel & Gate Paragraph 1, Last Sentence.**

Please provide Figure 2-3 as it is missing from the document.

**22. Page 2-30, Section 2.7.9.1, Wetland Creation/Restoration; Shoreline Extension (Effectiveness) Paragraph 1, Sentence 3.**

*The low levels of COC in landfill seeps are not anticipated to adversely affect shoreline wetlands.*

Until the effects of biodegradation and volatilization are further characterized the Division believes that groundwater modeling, conducted by the Navy, demonstrates significant effects on Allen Harbor sediment (reference RIDEM comment #8 on Phase III RI dated 26 February 1996). Therefore, until further characterization is completed the effects of groundwater contamination could adversely affect wetlands creation and the above

statement should be removed from the text.

**23. Page 2-31, Section 2.7.9.1, Wetland Creation/Restoration; Shoreline Extension Paragraph 2, Sentence 2.**

Referencing biochemical and geochemical filtration:

*Both occur because the placement of the wetland--between the source and receiving areas-- is appropriate and effective.*

The Navy, in conjunction with the regulators and public, will determine what is appropriate. The above referenced sentence should be revised as follows:

*Both occur because the placement of a wetland between the source and receiving waters has been shown to be effective in mitigating both organic and inorganic compounds (reference).*

**24. Page 2-32, Section 2.7.9.1, Wetland Creation/Restoration; Shoreline Cutback (Implementability) Paragraph 1, Sentence 2.**

*If incorporation of the entire volume into the cap design is not feasible, the materials would need to be transported and disposed offsite at a permitted facility.*

The Navy estimates that the cutback volume would be approximately 48,000 cubic yards of material. Based on the Allen Harbor Landfill design submitted by the Navy in April 1994 and a very rough calculation well over one half million cubic yards of material could be placed on the landfill before any of it would have to be transported and disposed of offsite.

**25. Page 2-32, Section 2.7.9.1, Wetland Creation/Restoration; Shoreline Cutback (Implementability) Paragraph 1, Sentence 3.**

*Excavation to depths of 20 to 25 ft may not be possible with standard excavation equipment along the shoreline.*

The above sentence should be modified to indicate that equipment is readily available to excavate to such depths since similar excavations were conducted for the McAllister Point Landfill without any problems.

**26. Page 2-32, Section 2.7.9.1, Wetland Creation/Restoration; Shoreline Cutback (Implementability) Paragraph 1, Sentence 5.**

*The additional 48,000 cy estimated to be removed during shoreline cutback, and placed onsite, may have the effect of "making a mountain" at the site by increasing the height of the site 2 to 3 ft to a total additional height of the site to 9 to 10 ft.*

In essence this sentence states that by cutting the slopes back to create wetlands, with that material placed on top of the landfill, the height of the landfill itself will increase by

an additional 2 to 3 ft beyond any capping scenario. Given that the final elevation of the landfill will be around 30 ft above sea level, perhaps the Navy can cite the elevation at which the "making of a mountain" has occurred. The phrase "making a mountain" is extremely biased in this case and should be removed from the text.

**27. Page 2-34, Section 2.7.9.3, Shellfish Improvement;  
Harbor Depuration (Implementability).**

Please be advised that a permit will be required from RIDEM Fish and Wildlife Division and Division of Water Resources for the removal and replacement of shellfish beds.

**28. Page 3-2, Section 3.1.2, Alternative 2: Soil Cap;  
Paragraph 2, Sentence 9.**

*Excavated sediment will either be placed onsite beneath the cap, if the sediment contains debris or other non-sediment objects, or placed beneath sediment used to create shoreline wetlands.*

Contaminated materials should not be used in the creation of wetlands. Therefore, contaminated sediment should be placed beneath the landfill cap.

**29. Page 3-8, Section 3.2.3.4, (Multimedia Cap) Conclusions;  
Paragraph 1, Sentence 1.**

Please explain the "design difficulties" noted in this sentence. The Navy is reminded that they have recent experience with McAllister Point landfill which in many respects is similar to this landfill.

**30. Page 4-5, Section 4.4.1.1, Soil Cap;  
Paragraph 2, Last Sentence.**

If gas vents are required, then a fence will need to be placed around the entire site, including the seaward side. The State of Rhode Island views this as a safety concern since we have at least one documented case of children entering a landfill and being overcome by fumes emanating from gas vents. A possible alternative to this scenario is to manifold all gas vents together with one point of discharge and place a fence around just that discharge point.

**31. Page 4-7, Section 4.4.2.1, (Soil Cap) Overall Protection of Human Health and the Environment;  
Paragraph 1, Sentence 5.**

*Although some infiltration will continue, the reduced leaching is anticipated to reduce the offsite migration of COC at concentrations above state and federal marine chronic AWQC.*

Please state if the Navy is indicating that the soil cap is ineffective since COC

concentrations cannot be reduced to below state and federal AWQC.

- 32. Page 4-7, Section 4.4.2.1, (Soil Cap) Overall Protection of Human Health and the Environment;  
Paragraph 2, Sentence 3.**

*Constructed wetlands will provide constituent degradation and removal processes that have been shown to be effective in removing elevated heavy metals and organics from influent water, and would thereby act as a buffer to reduce marine organism exposure to site related COC.*

Section 4.4.1.3, last paragraph notes that shellfish would be put back within the created wetlands. If the purpose of the created wetlands is to remove heavy metals and organic compounds please state why the Navy would want to deploy shellfish in this environment where they would uptake these compounds.

- 33. Page 4-8, Section 4.4.2.2, (Soil Cap) Compliance with ARARs;  
Paragraph 1, Sentence 6.**

*Construction of a soil cap complies with the 1988 revisions to the NCP allowing for hybrid landfill closure at sites that do not pose a threat to ground water (when ground water is not a viable risk pathway for human and ecological health).*

The Division does not concur at this time with this statement. Based on the groundwater modeling results the Division believes there may be significant effects of the shallow groundwater on sediment and hence the environment (reference RIDEM comment #8 on Phase III RI dated 26 February 1996).

- 34. Page 4-8, Section 4.4.2.2, (Soil Cap) Compliance with ARARs;  
Paragraph 2, Sentences 1 and 2.**

These two sentences deal with the allowable slope of the revetment and note that CRMP regulations take precedence over Rhode Island Solid Waste regulations. Please be advised that the more stringent regulations apply, both on a federal and state level.

- 35. Page 4-13, Section 4.5.1.1, Multimedia Cap;  
Paragraph 2, Sentence 5.**

*This bedding layer could be comprised of sediment dredged from the entrance to Allen harbor and may, depending on the potential usability of the sediment for creation of wetlands, be greater than 12 in. in order to incorporate a greater volume of sediment.*

The bedding material must be a clean granular material with a higher effective porosity than the underlying waste material, otherwise gases will travel laterally through the waste material; i.e. following path of least resistance instead of upwards through the bedding layer to collect into the gas venting layer. Dredge material is typically loaded with fines which would make it unsuitable as a bedding material. This issue needs to be considered when reviewing the test data of this material.

The Navy has expressed concern about placing additional weight above the existing landfill materials due to concerns of settling which in turn could affect the integrity of the multimedia cap. Please explain why the Navy would want to increase the thickness of the bedding layer beyond 12 inches when it is not required given the above noted concern.

**36. Page 4-14, Section 4.5.1.1, Multimedia Cap;  
Paragraph 2, Sentence 4.**

*This creates a 25-in. layer above the impermeable liners in order to protect them against frost penetration during the winter months in Rhode Island.*

Please be advised that a 36 inch layer should be provided above the impermeable layer to protect against frost penetration. For the McAllister Point Landfill this consisted of a 6 inch vegetative layer, 18 inch cover layer, and a 12 inch drainage layer.

**37. Page 4-15, Section 4.5.2.1, (Multimedia Cap) Overall Protection of Human Health;  
and Environment  
Paragraph 1, Sentence 5.**

This sentence states that based on groundwater data and groundwater modeling a multimedia cap will have little impact in reducing potential risk to marine receptors. The Division does not concur at this time with this statement. Based on the groundwater modeling results the Division believes there may be significant effects of the shallow groundwater on sediment and hence the environment (reference RIDEM comment #8 on Phase III RI dated 26 February 1996).

**38. Page 4-16, Section 4.5.2.1, (Multimedia Cap) Overall Protection of Human Health;  
and Environment  
Paragraph 2.**

*The site barrier fence erected to protect the multimedia cap from terrestrial animal and public intrusion will block terrestrial animal movement along the western side of Allen Harbor. The lack of deep-rooted vegetation covering the multimedia cap will also detract from the avian habitat of Allen Harbor and the natural upland appearance to recreational users of Allen Harbor.*

The above paragraph, while technically true, is very biased in nature. For example "site barrier fence" should be changed to "chain link fence", "public intrusion" should be changed to "public access" and a grass cover for the landfill is certainly better than the 15 foot high steel sheetpile wall the Navy originally proposed for remediation of this site.

**39. Page 4-16, Section 4.5.2.2, (Multimedia cap) Compliance with ARARs;  
Paragraph 2.**

This paragraph deals with the allowable slope of the revetment and notes that CRMP regulations take precedence over Rhode Island Solid Waste regulations. Please be advised that the more stringent regulations apply, both on a federal and state level.

- 40. Page 4-16, Section 4.5.2.2, (Multimedia Cap) Compliance with ARARs; Paragraph 3, Sentence 4.**

*Based on the serious concerns with containment of mobilized wastes associated with large-scale cutback of the site to create shoreline wetlands.....*

Based on the above statement the Navy is indicating that there are unopened barrels of chemicals still contained within the wastes. If this is the case then a soil cap will not provide sufficient protection for those barrels above the water table since precipitation will percolate through the vadose zone deteriorating the remaining barrels.

- 41. Page 4-17, Section 4.5.2.3, (Multimedia Cap) Long-Term Effectiveness and Permanence; Paragraph 2, Sentences 2 and 3.**

These sentences state that the frost depth in North Kingstown is 25 in. and therefore the vegetative support layer and barrier layer should have a minimum thickness of 25 in. to mitigate the effects of frost. Please be advised that 36 in. is the standard that is used in Rhode Island. It should also be noted that the McAllister Point Landfill at NETC has 36 in. of cover material over the impermeable layer.

- 42. Page 4-17, Section 4.5.2.3, (Multimedia Cap) Long-Term Effectiveness and Permanence; Paragraph 2, Sentence 5.**

*Landfill gas generation, though expected to be minimal, will be addressed by a venting system.*

Please be advised the Navy will need to conduct studies on landfill gas to determine whether a passive or active gas venting system is appropriate for this site.

- 43. Page 4-17, Section 4.5.2.3, (Multimedia Cap) Long-Term Effectiveness and Permanence; Paragraph 2, Last Sentence.**

*The effectiveness of a multimedia cap and revetment containment system in controlling risks from fill constituents under 100-year flood conditions is uncertain, due to the incorporation of synthetic materials into an engineered construction effort.*

Please explain in detail why a multimedia cap is more susceptible to damage from the elements than a soil cap would be.

- 44. Page 4-21, Section 4.6.1.2, (Alternative 4) Vertical Barrier Wall; Paragraph 1, Last Sentence.**

This sentence states that the pine trees along Sanford Road would be removed to construct the slurry wall. The Navy should state if it is possible to plant new trees in this general location which would not impact the cap or slurry wall.

- 45. Page 4-23, Section 4.6.2.1, (Alternative 4) Overall protection of Human Health and Environment;  
Paragraph 1, Sentence 2.**

*As discussed for Alternative 3, RI data and ground-water modeling indicate that the current offsite migration of COC in ground water is minimal and does not contribute to the potential risks calculated for marine organism exposure to intertidal sediment along the site shoreline.*

The Division does not concur at this time with this statement. Based on the groundwater modeling results the Division believes there may be significant effects of the shallow groundwater on sediment and hence the environment (reference RIDEM comment #8 on Phase III RI dated 26 February 1996).

- 46. Page 4-23, Section 4.6.2.2, (Alternative 4) Compliance with ARARs;  
Paragraph 1, Sentence 3.**

This sentence states that the cap liner will have to end prior to the riprap revetment to avoid slope instability concerns. In order for the public to understand this please explain in detail why this is so.

- 47. Page 4-23, Section 4.6.2.2, (Alternative 4) Compliance with ARARs;  
Paragraph 2.**

This paragraph deals with the allowable slope of the revetment and notes that CRMP regulations take precedence over Rhode Island Solid Waste regulations. Please be advised that the more stringent regulations apply, both on a federal and state level.

- 48. Page 4-26, Section 4.6.2.5, (Alternative 4) Short-Term Effectiveness;  
Paragraph 4, Last Sentence.**

*An increase in noise levels in Allen Harbor will be associated with remedial action activities, though at levels well below risk levels.*

Please state what levels of noise are would exceed risk levels. In addition, please state which model was used to predict that noise levels would be acceptable. levels.

- 49. Page 4-27, Section 4.6.2.6, (Alternative 4) Implementability;  
Paragraph 3.**

This paragraph states that the multimedia cap and vertical barrier wall/revetment system would inhibit the implementation of other remedial actions if it were found to be ineffective. It is assumed this statement is made since either the cap and/or vertical barrier system would need to be penetrated to implement another remedial system.

It should be pointed out that it is technically feasible to penetrate the cap. Secondly, if the system is ineffective please explain what difference it would make if the cap and/or vertical barriers are penetrated since it would not be working anyway. Therefore, either

these issues should be explained in the text or the paragraph should be removed from the text.

**50. Figure 1-6, Phase 1 Marine ERA and Phase II and III Risk Assessment Pilot Study Sampling Locations.**

A legend is needed describing the symbols for the various sampling locations.

**51. Table 5-2, Summary of Comparative Analysis of Remedial Alternatives for Site 09; Adequacy and Reliability of Controls.**

For the multimedia cap it is stated that it is inevitable that the cap liner will decay. The Navy is reminded that man made cap materials, (what the Navy would propose to use) last for a very long time in the environment. Certainly longer than the 30 year life span of this project. This should be mentioned in the text.

In addition, the Navy states that long term maintenance of the cap is required to maintain effective impermeability of the multimedia cap. A similar statement is not made for the soil cap which would also require long term maintenance for the same reasons. Please state if the Navy plans on long term maintenance of the soil cap.

**52. Table 5-2, Summary of Comparative Analysis of Remedial Alternatives for Site 09; Ease of Conducting Other Actions, If Needed, Alternative 3.**

This section states that potential future actions at the site will be prohibited from damaging the multimedia cap. This section should also point out that the cap liner can be penetrated, if necessary and still maintain the function of the various layers using proper construction techniques. The same can also be said of the soil cap.

**53. Table 5-2, Summary of Comparative Analysis of Remedial Alternatives for Site 09 Footnote (c).**

This footnote notes that if the slurry wall or steel sheetpile wall fail and new ones need to be constructed the total present worth cost for Alternative 4 will be substantially higher. If both the slurry wall and steel sheetpile wall were to be replaced the cost, based on 1996 dollars, would be \$2,775,000 which represents 19% of the total present worth of the alternative. The Division, therefore, disagrees that the present worth cost would be "substantially" higher if the groundwater containment would need to be replaced. As the Navy points out on Page 4-25, typically both slurry walls and sheetpile walls can have a design life of 30 years. As a result, footnote (c) should be modified to indicate that after a life of 30 years the slurry wall/ and or steel sheetpile wall may need to be replaced at a cost of \$2,775,000 which represents 19% of the total present worth of the site.

**54. General Comment.**

Refer to comment #3 of RIDEM's 1 November 1995 letter regarding the Draft Phase III RI. The purpose of this comment was to evaluate the impact of a soil and RCRA Subtitle C cap on groundwater quality. The Navy stated in their 8 December 1995 response to

the Draft Phase III RI that this would be considered as part of the feasibility study. This information was not provided. Please provide.

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